

| <b>Species/Media</b>                               | <b>Monitoring Program Description</b>   | <b>Agency</b>                      | <b>Contact</b>                 |
|--|---|------------------------------------|--------------------------------|
| <b>Herring</b>                                     | 3 monitoring locations: North Sound/Southern Strait of Georgia, Port Orchard, Squaxin Island  | WDFW                               | James West                     |
| <b>English Sole</b>                                | 10 monitoring stations throughout Puget Sound   | WDFW                               | James West                     |
| <b>Mussels</b>                                     | Approx 100 mussel sites<br>Ecology added 13 PBDE congeners to annual sediment monitoring in 2004.<br>Cycles through 8 Puget Sound regions on a 10 yr rotation, 6 urban bays on a 6 yr rotation, and 10 long-term "sentinel" stations every 5 years. | Consortium-<br>WDFW was lead       | Jennifer Lanksbury             |
| <b>Sediment</b>                                    | Nearshore sediment monitoring   | Ecology<br>Ecology                 | Maggie Dutch<br>Karen Dinacola |
| <b>Puget Sound Southern Resident Killer Whales</b> | Blubber biopsy samples  | NW Fisheries Science Center        | Gina Ylitalo                   |
| <b>Puget Sound Southern Resident Killer Whales</b> | Scat samples  | UW Center for Conservation Biology | Sam Wasser,<br>Jessica Lundin  |
| <b>Harbor Seals</b>                                | Intermittent harbor seal monitoring; retroactive analysis for stored samples  | Peter Ross and WDFW                | Steve Jeffries                 |
| <b>Salmon - Chinook adults</b>                     | WDFW has historical data  | WDFW                               |                                |
| <b>Salmon - Coho adults</b>                        | WDFW has historical data  | WDFW                               |                                |
| <b>Bull Trout</b>                                  | Puget Sound bull trout  | USFWS                              | Jay Davis                      |

|   |  |         |                     |
|---|--|---------|---------------------|
| <b>Shrimp and Crabs</b>   | One-time sampling throughout the basin   | WDFW    | James West          |
| <b>Ambient/Water Column</b>   | Past studies, recent journal article in Canada. Still a need but nothing ongoing or proposed.  |         |                     |
| <b>Birds</b>  | Osprey eggs  | USGS    | Chuck Henny-retired |
| <b>Wastewater Effluent</b>  | In 2009, Ecology conducted a study to estimate the toxic loadings to Puget Sound via 10 NPDES-permitted WWTPs. Sampled Feb & July. Pg/L level. These 10 WWTPs were representative of municipal WWTP discharge into PS and comprised 48% of actual discharge. | Ecology | Jim Marconelli      |
| <b>Juvenile Chinook Salmon</b>  | One-time study re: PBDEs in outmigrant Chinook in rivers and nearshore estuaries in Puget Sound  | WDFW    | Sandie O'Neill      |
| <b>Watershed Loading</b>  | 3 past-loading studies. PS Toxics, Box Model. Preliminary indications of box model suggest that current PBDE loadings estimates may be too low.  | Ecology | Jim Maroncelli      |
| <b>PBDEs Flame Retardants in Washington Rivers and Lakes: Concentrations in Fish and Water, 2005-06</b> | Statewide study looking at PBDEs in freshwater fish, sediment, water-looking for a background concentration  | Ecology | Dale Norton         |
| <b>Spokane River</b>  | Monitoring on Spokane River, osprey eggs and fish tissue (large scale suckers, white fish- to match what osprey were feeding)  | Ecology | Callie Mathieu      |

|  |  |                                      |
|--|--|--------------------------------------|
| <b>PBDE Chemical Action Plan</b>   | Summarizes what we know about PBDEs in the state. PBDE phase out. Ecology  | Holly Davies                         |
| <b>PBDE Exposure on juvenile salmon</b>  | Effects of PBDE exposure on immune function of juvenile salmon   | NOAA with EPA funding                |
| <b>Wastewater Effluent entering the Columbia River</b>   | Reconnaissance of contaminants in selected wastewater-treatment-plant effluent and stormwater runoff entering the Columbia River, Columbia River Basin, Washington and Oregon, 2008–10. 8 or 9 WWTPs around the Columbia River. Included PBDEs | Jennifer Morace<br>jlmorace@usgs.gov |
| <b>Control of Toxic Chemicals in Puget Sound: Assessment of Selected Toxic Chemicals in the Puget Sound Basin, 2007-2011</b> | Puget Sound Toxic Loadings Analysis: major pathways of contaminants into Puget Sound. Included PBDEs.  | Ecology and King County              |
|  |  | Dale Norton                          |
|  |  |                                      |
|  |  |                                      |
|  |  |                                      |
|  |  |                                      |
|  |  |                                      |

| Current Status  | Other Comments  | Link  |
|---|---|---|
| Samples will be collected, but no funding for chemical analysis so just archiving samples   |   |   |
| Will be collected, but no funding for chemical analysis so just archiving samples   |   |   |
| Pilot study with no ongoing funding; some mussel monitoring in nearshore proposed as part of NPDES stormwater permits                             |   |   |
| Planned to continue<br>Planned  | Collecting PBDE data from top 2-3 cm of sediments around PS since 2004<br>Via NPDES stormwater permittees | <a href="http://www.ecy.wa.gov/biblio/11030">www.ecy.wa.gov/biblio/11030</a>  |
| Collected opportunistically   |   |   |
| Funding for 2014 field season currently uncertain.<br>Currently unfunded. High priority for TWG and MMWG.   | "Canines for Conservation" dogs help find scat samples<br>PSEMP Marine Mammal Workgroup addressing this - | <a href="http://conservationbiology.net/">http://conservationbiology.net/</a> |
| Discontinued in 1998. New monitoring has been proposed, but no funding for chemical analysis  | Adult Chinook showed elevated PBDE levels.  |   |
| Discontinued in 2008. Not currently being collected. Funding to restore this program has been proposed. One-time study, currently looking at data |   |   |

|  |  |
|--|--|
| No ongoing program; no proposal to continue.<br>Discontinued- the program got "retired" when Chuck Henny left                          | Variable and difficult to detect. Not prioritized by PSEMP TWG because it would be \$\$\$ and result in many non-detects.  |
|  | Currently no active bird monitoring for toxics   |
| One-time study   | Although the POTWs discharged many PBDEs, only 3 of them (BDE-047, BDE-099, and BDE-209) comprised almost all of the total loadings. Everett, KC West Point, and Tacoma discharged the most PBDEs. Phase 3 study indicated that air deposition was twice the mass loadings of WWTPs. <a href="https://fortress.wa.gov/ecy/publications/">https://fortress.wa.gov/ecy/publications/</a> |
| 2013- sampled 5 major watersehds- Skagit, Snohomish, Duwamish, Nisqually, Commencement Bay/Hylebos. Results should be back spring 2014 | <a href="https://fortress.wa.gov/ecy/publications/">https://fortress.wa.gov/ecy/publications/</a>  |
|  | <a href="https://fortress.wa.gov/ecy/publications/">https://fortress.wa.gov/ecy/publications/</a>  |

This study is wrapping up

Sampling and analysis was conducted at nine WWTP facilities in the Columbia river basin (Wenatchee, Richland, Umatilla, The Dalles, Hood River, Portland, Vancouver, St. Helens, and Longview). Generally, single grab samples were collected at each location locations. Repeat sample were collected at some locations. Stormwater sampling (and analysis) was performed at outfalls in 10 different cities.

<http://pubs.usgs.gov/sir/2012/5068/>



[publications/1010057.pdf](#)

[summarypages/0603027.html](#)

[summarypages/1003015.html](#)

summarypages/0507048.html